Converged Network Architecture to overcome network virtualized decoupling

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Abstract

after network virtualized through the Overlay technology, making decoupling of the application and the physical network, but the network and calculation is independent from each other, the current network architecture still cannot achieve the linkage of the network and Virtual machine.in this paper, based on particular experience we suggest of guidance or roadmap of converged network to overcome any issue on virtual network

Introduction

Why IT need virtualization ?

Server virtualization technology enables CPU, memory, disk and I / O hardware into “the pool of resources” in dynamic management, thus improving the utilization of resources, making IT more adaptive to changes in the business. IT system is composed of network server storage and many other factors, while local innovation does not bring the overall upgrade of the IT system, so the storage also needs virtualization, and the network is required to innovate to meet the overall performance of the IT system upgrade as well.

PROBLEMS CAUSED BY SERVER VIRTUALIZATION

A.Two Layer Technology Deployment Issues

Multiple server virtualizations for one resource pool requires all the servers in the same two layers, but all of these two layers of technology require all devices support the characteristics, which remains a variety of restrictions in deployment, so these technology could not be applied in large-scale.

B. Border Management Issues

After the introduction of server virtualization, a virtual machine switches is added between virtual machines and physical network devices. The traffic monitoring and access for virtual machines in one vSwitch needs to be done in the vSwitch, but vswitch is typically managed by the host personnel for maintenance, for technical reasons, the host researchers tend not to configure the network strategy, while network administrators do not have access to vswitch, which makes vswitch become a blind area in management.

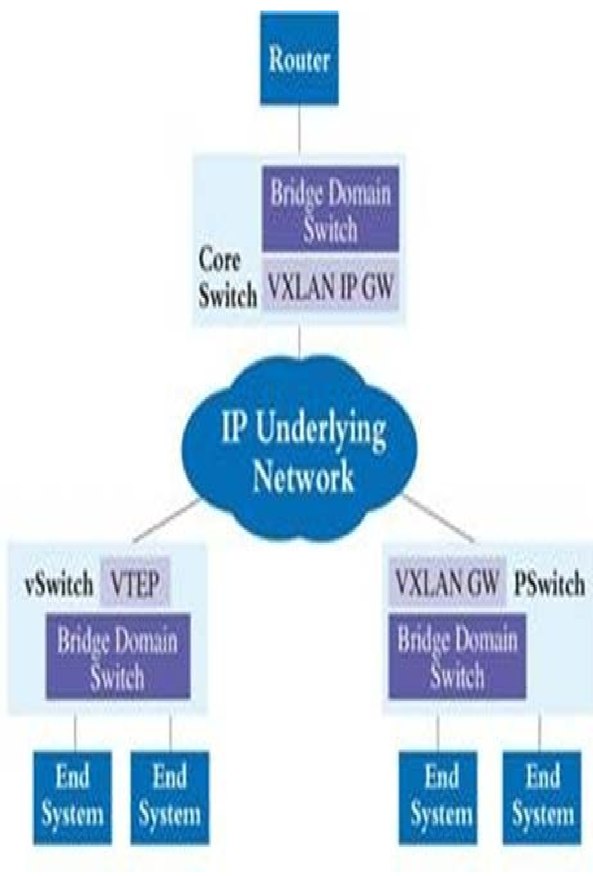
C.Virtual Machine Migration Strategy Following Issues

The appropriate network security strategy also migrates to the new network equipment .There is a huge risk of incorrect operation, so the configuration of the migration will increase the operational risk of the whole IT system, so we need new solutions to solve virtual machine migration strategy.

Guidance for solving these issue

The above problems can be solved by following methods : First, to simplify the physical network structure, improve the reliability and reduce the operation difficulty by the device virtualization technology. Second, to simplify the connection between the virtual machine and the physical network through the Overlay virtual connection technology, and then realize the network centralized control and management through VCF (Converged Framework Virtual), finally make it interact between virtual machine and virtual net. The VXLAN protocol used in the construction of the two layers, also can meet the demands of public cloud construction in multi tenant isolation.

VXLAN Message transfer



As shown in Figure, the VXLAN network device has three main roles, namely VTEP (Tunnel End Point VXLAN), GW VXLAN(Gateway VXLAN), IP GW VXLAN (IP Gateway VXLAN), all of them are the edge device of physical network, and there are three kinds of edge devices that constitute the Overlay VXLAN network. For the application system, only these three devices are related to which has nothing to do underlying physical network. Here we Overlay Technology to improve the decupling

Overlay network and external network data communication also has a variety of implementation modes, and the key network components have different technical requirements.

Network Overlay scheme also making all the physical access switches support VXLAN, and the physical server supports SR-IOV functionality, making directly connected to the switches.

CONCLUSION

There is need for a new Virtual Converged Framework architecture to realize the linkage of the application and network, here we introduce a new Virtual Converged Framework architecture - VCF. In constructing Overlay control plane, there are two main implementation ways, one is the learning mode (multicast, ISIS, BGP), another is the centralized control mode (the Controller). The centralized control mode can be applied by Controller to achieve Practical application linked to network.VCF architecture is to make the realization of the network and application by way of centralized control.